UM1764
User manual

VL6180X premium evaluation kit (EVK) software

Overview

The VL6180X proximity sensor premium EVK demonstrates the basic proximity, ranging and light sensing capabilities of the VL6180X sensor.

The premium EVK software utility interfaces with the VL6180X proximity sensor premium EVK to perform range, signal and ambient light measurements and display results in both graphical and numerical form. Additionally, the utility provides the facility to configure and calibrate the VL6180X device and provides comprehensive access to internal data for diagnostic purposes.

The purpose of this user manual is to describe how to setup and use the premium EVK software for evaluation, configuration and demonstration.

References

1. *VL6180X premium evaluation kit (EVK) hardware user manual* (DocID024985)
2. *VL6180X datasheet* (DocID026171)

Glossary

ALS	Ambient light sensor
EVK	Evaluation kit
I2C	Inter-integrated circuit serial communications interface
MCpS	Mega counts per second
NVM	Nonvolatile memory
P2P	Part-to-part
SNR	Signal to noise ratio
ToF	Time of flight
UI	User interface
VL6180X	Proximity sensor
X-talk	Cross-talk compensation factor

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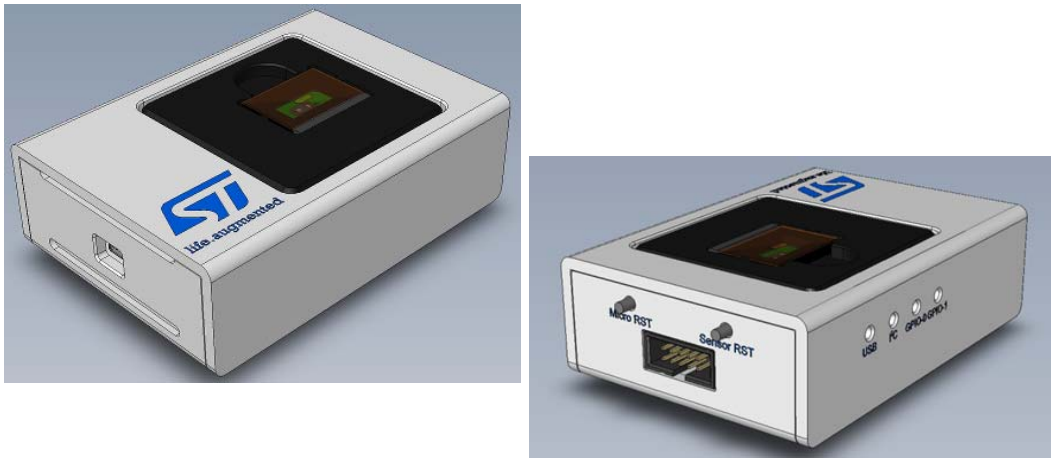
1 Introduction

This document describes how to set up and use the VL6180X premium EVK software utility.

The premium EVK hardware is described in the *VL6180X premium evaluation kit (EVK) hardware user manual* (DocID024985).

Figure 1. VL6180X premium evaluation kit (EVK)



1.1 Installing the premium EVK software utility

The premium EVK software utility is available from http://www.st.com/web/catalog/tools/FM147/SC1870/PF260779 .

Double-click on the `setup.exe` application and then follow the on-screen instructions to install the VL6180X premium EVK software utility.

Minimum installation requirement is Windows XP (SP3).

1.1.1 Trouble shooting

If an installation fails, the user should ensure that any previous installations are removed as follows:

- Select “Start Menu – Control Panel - Programs and Features”

- Locate any entries of VL6180X premium EVK and uninstall (Select Right Click - Change - Next - Remove)

then attempt the installation again.

1.2 Launching the premium EVK software

To launch the premium EVK software utility, double click on the **VL6180X EVK 1-04** shortcut created on the desktop.

2 Premium EVK software user interface

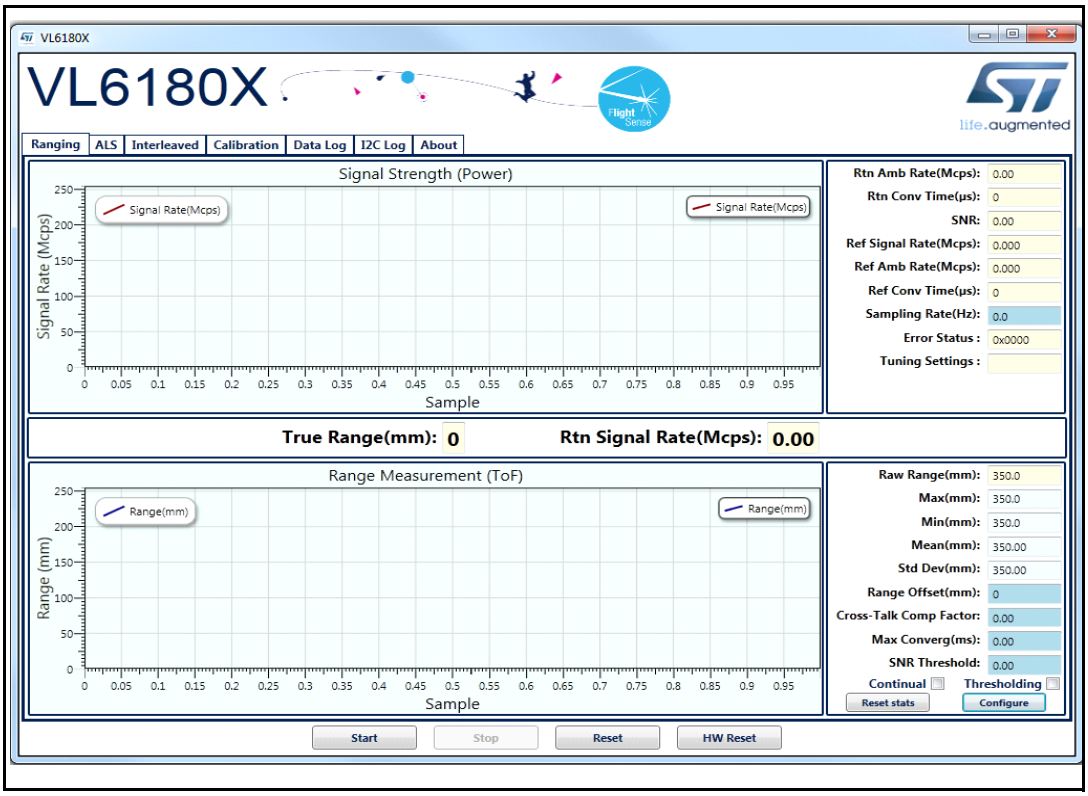
When the premium EVK software is launched, the **Ranging** tab is displayed containing the ranging mode interface as shown in *Figure 2*.

The ranging mode interface consists of two graphs, **Signal Strength (Power)** and **Range Measurement (ToF)** (where ToF is short for Time of Flight).

To use the software, place a target above the VL6180X premium EVK hardware and click on **Start**. The device begins ranging and the **Signal Strength** and **Range Measurement** graphs will display data in real-time and numerically in the boxes to the right.

Note: The true range may be incorrect until the device has been calibrated (see Section 2.1).

Figure 2. Ranging mode interface



The premium EVK software contains several tabs that can be used to display, calibrate and configure various features of the premium EVK. The available tabs are:

- **Calibration**, see *Section 2.1*
- **Ranging**, see *Section 2.2*
- **ALS**, see *Section 2.3*
- **Data Log**, see *Section 2.4*
- **I2C Log**, see *Section 2.5*
- **Interleaved**, see *Section 2.6*
- **About** - this tab provides a summary of the premium EVK software

2.1 Calibrating the VL6180X

In order to get accurate readings, the user may be required to calibrate the VL6180X range offset and the cross-talk compensation factor. This is carried out in the **Calibration** tab.

*Note: To move from the **Ranging** tab to the **Calibration** tab, the VL6180X must stop ranging.*

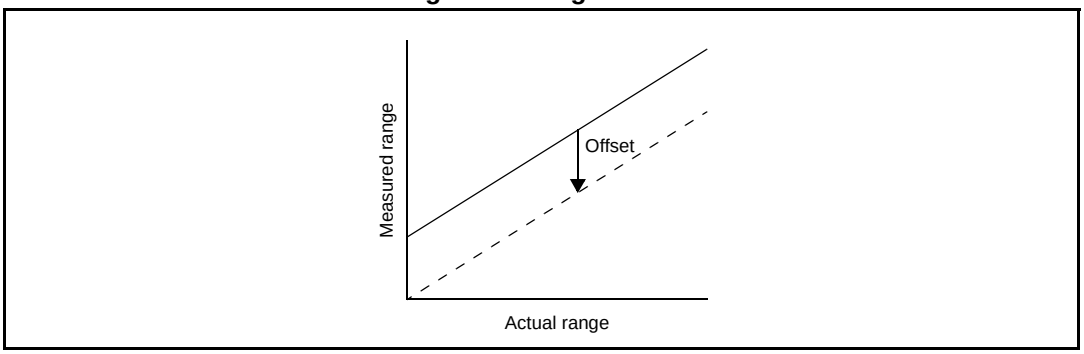
2.1.1 Calibrating the range offset

The VL6180X device requires a unique part-to-part range offset correction. The default programmed value may be correct, however it may be required for the user to override this and apply a different setting.

To calibrate the range offset use the calibration tool delivered with the VL6180X premium evaluation kit and described in the VL6180X premium evaluation kit (EVK) hardware user manual (UM1651). The resultant offset is added to the raw range: $R_0 = R_r$ + offset, where R_0 is the offset range and R_r is the raw range in mm, see *Figure 3*.

If there is a glass in front of the VL6180X device a unique cross-talk compensation factor must be determined and applied. If the glass configuration is altered in any manner, a new cross-talk compensation factor must be determined.

Figure 3. Range offset

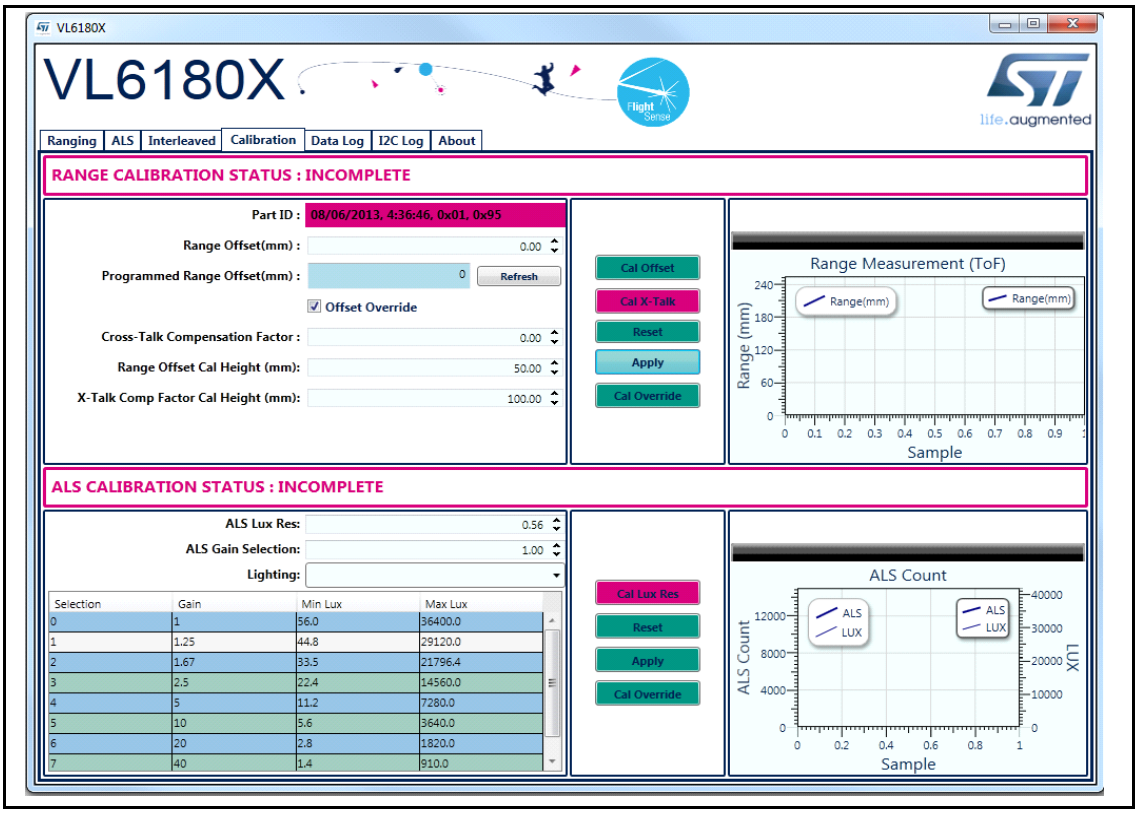


The factory calibrated NVM offset is used by default. Manual calibration is only required if the offset is incorrect, resulting in incorrect range measurements.

To activate the automatic offset calibration, tick the **Offset Override** check box (this will turn yellow), then click the **Apply** button. The **Cal Offset** button will now become available (see *Figure 4*), follow the on-screen instructions to complete the calibration.

To manually apply offset calibration, enter the offset value in the **Range Offset (mm)** field **(after ticking the Offset Override check box)** and click on **Apply**.

Figure 4. Offset calibration

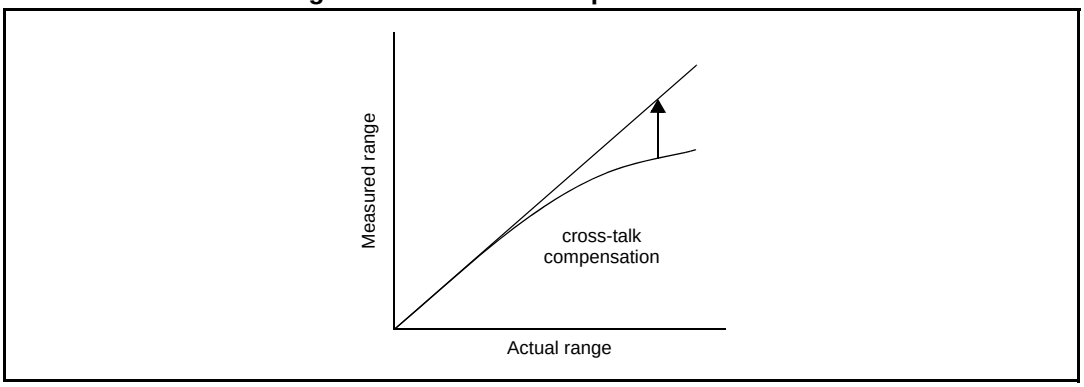


2.1.2 Calibrating cross-talk compensation factor

The glass in front of the VL6180X device introduces stray light, also known as cross-talk, where a proportion of the emitter output is reflected back to the receiver. This distorts the range measurement but can be corrected by applying cross-talk compensation.

If there is glass in front of the VL6180X device a unique cross-talk compensation factor must be determined and applied. If the glass configuration is altered in any manner, a new cross-talk compensation factor must be determined.

Figure 5. cross-talk compensation factor



The cross-talk compensation factor (x-talk) is calibrated with the premium EVK using a target of approximately 3% (black) reflectance, at least 60 x 60 mm square, placed 100 mm above the sensor.

To activate automatic x-talk calibration, click on the pink **Cal x-talk** button, follow the on-screen instructions then click **Apply**. Once calibrated the button will turn green.

To manually set the x-talk, enter the x-talk value in the **cross-talk compensation factor** field and click on **Apply** as shown in *Figure 4*.

2.2 Measuring the range

When the premium EVK software is in ranging mode, it measures absolute range from the sensor to a target. This is shown in graphical form in the **Ranging** tab, see *Figure 2*.

The **Ranging** tab displays two graphs:

- **Signal Strength (Power)**, see *Section 2.2.1*
- **Range Measurement (ToF)**, see *Section 2.2.2*

The buttons listed in *Table 1* are available at the bottom of the tab.

Table 1. Buttons in the Ranging tab

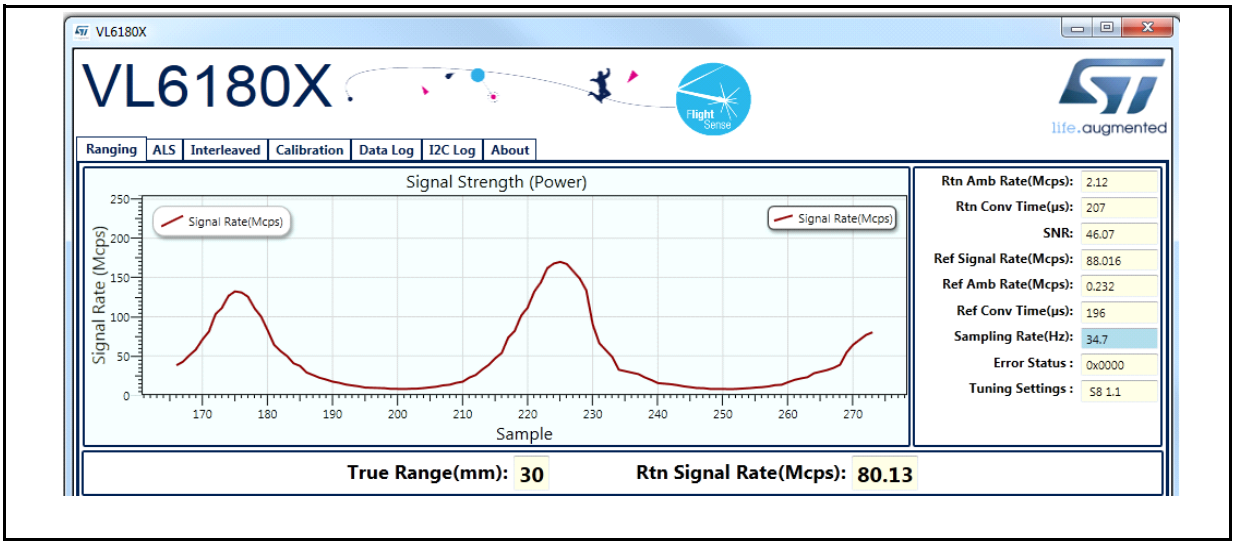
Button	Description
Start (**Pause/Resume**)	Click on **Start** to begin ranging. The **Start** button changes to **Pause/Resume** while the device is ranging.
Stop	Click on **Stop** to stop ranging.
Reset	The **Reset** button resets the I^2C communications interface between the application and the VL6180X.
HW Reset	The **HW Reset** button resets the VL6180X hardware.
Reset Stats	The **Reset Stats** button clears the measurement statistics **Max**, **Min, Mean** and **Std Dev** values.
Configure	The **Configure** button displays the **Configuration** dialog which allows the user to configure key parameters and initialization settings (see *Section 2.2.3*).

2.2.1 Signal Strength (Power) graph

The **Signal Strength (Power)** graph plots, in real time, the Signal Rate (Mega Counts per Second) returned from the target, as shown in *Figure 6*.

The Signal Rate can be viewed as a measure of the reflectance of the target, with high reflectance targets producing stronger signal rates.

Figure 6. Signal Strength (Power) graph



To the right of and below the **Signal Strength** graph the information described in *Table 2* is displayed.

Table 2. Signal Strength information

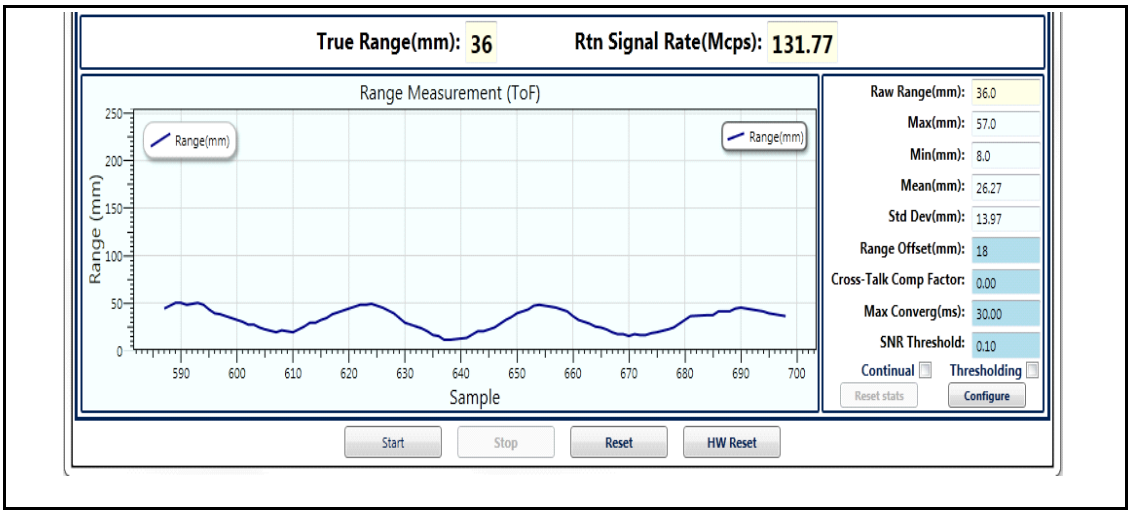
Field	Description
Rtn Signal Rate (MCpS)	Number of ToF pixel counts per second on the return array.
Rtn Amb Rate (MCpS)	Number of ToF pixel counts per second due to ambient light on the return array.
Rtn Conv Time (µs)	The time required to reach the convergence threshold on the return array.
SNR	Ratio of signal rate: ambient rate. A minimum SNR threshold can be set using the **Configuration** dialog (see *Section 2.2.3*) below which a range measurement is rejected. The SNR threshold is typically set in the range 0.1 to 0.3.
Ref Signal Rate (MCpS)	Number of ToF pixel counts per second on the reference array.
Ref Amb Rate (MCpS)	Number of ToF pixel counts per second due to ambient light on the reference array.
Ref Conv Time (µs)	The time required to reach the convergence threshold on the reference array.
Sampling Rate (Hz)	Number of samples captured per second. The premium EVK software can use single-shot (default) or continuous ranging mode. Sampling rate is PC dependent.
Error Status	If there is an ranging error, the range result error code will be displayed here, as defined in the data sheet: Address 0x04D.
Tuning Settings	Displays the tuning settings file applied to override default settings.

2.2.2 Range Measurement (ToF) graph

The **Range Measurement (ToF)** graph plots, in real time, range measurements (see *Figure 7*). The maximum range is 255 mm. The vertical axis can be changed using the **Configuration** dialog (see *Section 2.2.3*). If a target is not detected, the maximum range is displayed.

*Note: The graph default is 255mm. **True Range** shows the correct numerical range and this may exceed the graph limits.*

Figure 7. Range Measurement graph



The VL6180X premium EVK can be run in single-shot ranging mode (default) or continuous ranging mode (by ticking the **Continual** check box). If in Continual ranging mode the time between measurements can be changed using the **Configuration** dialog (see *Section 2.2.3*).

The **Range Measurement (ToF)** graph can be changed to show threshold information, see Range Management (ToF) graph showing thresholds.

To the right of and above the **Range Measurement (ToF)** graph, the information described in *Table 3* is displayed.

Table 3. Range Measurement information

Field	Description
True Range (mm)	This reports the measured distance of a detected target (includes offset and x-talk).
Raw Range (mm)	This is the range measurement prior to applying cross-talk compensation (but includes offset).
Max, **Min**, **Mean**, **Std Dev (mm)**	These are post-processed measurement statistics to make noise evaluation easier to characterize. The max, min and mean are the range data measured by the sensor over 100 measured sample points.
Range Offset	This is a fixed offset parameter, unique to each part, which gets applied as part of the range measurement algorithm. This parameter must be determined for each part using the calibration procedure detailed in *Section 2.1: Calibrating the VL6180X*.
Cross-Talk compensation factor	This parameter gets applied as part of the range measurement algorithm. It must be determined for each different air gap/glass using the calibration procedure detailed in *Section 2.1: Calibrating the VL6180X*.
Max Convergence (ms)	This is the maximum time allowed for a range measurement to be made. No range output is given if the system has not converged within the specified time (that is, no target or target out of range).
SNR Threshold	In high ambient conditions, range accuracy can be impaired. The SNR limit is used to invalidate range measurements where the signal: ambient ratio is too low. The SNR threshold defines the signal-to-noise threshold, below which the range data is unreliable.
Continual	Changes ranging mode from single-shot to continuous mode
Thresholding	Check this box to enable upper/lower thresholds (defaults are 70 mm and 60 mm, see *Section 2.2.3*). When enabled, these threshold lines are shown in the **Range Measurement** graph. See “Range Management (ToF) graph showing thresholds”.

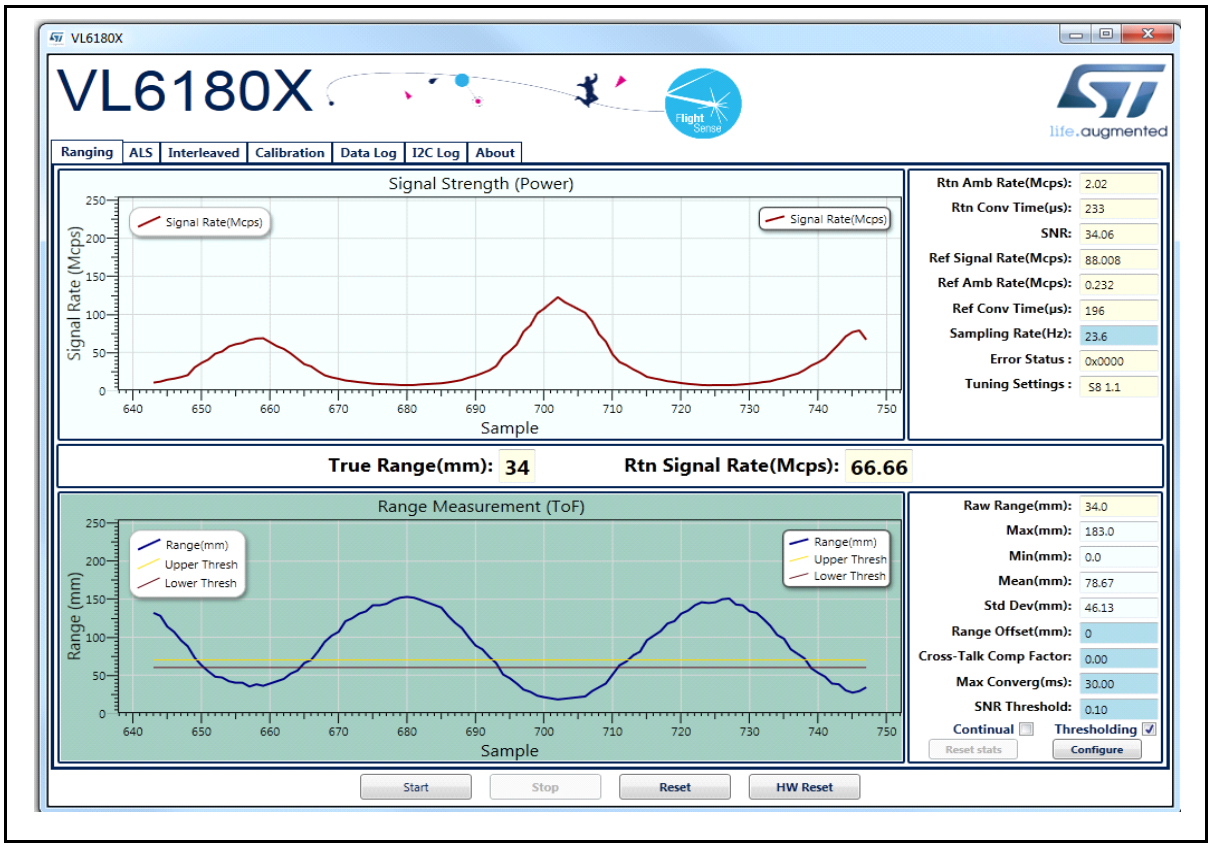
Range Management (ToF) graph showing thresholds

The thresholding feature allows the user to define upper and lower limits and be alerted as the range measurements transition across these limits by the display changing colour. *Figure 8* shows an example of the **Range Management (ToF)** graph with thresholding enabled. It shows a minimum threshold of 60 mm, a maximum threshold of 70 mm and a range measurement of 50 mm.

If the range measurement goes below the lower threshold the graph turns green. If it goes above the upper threshold the graph turns pink. The graph will stay pink/green, till the lower/upper threshold is crossed.

Thresholding is enabled by checking the **Thresholding** check box (see *Table 3*) and the upper and lower threshold settings can be modified in the **Configuration dialog** (see *Section 2.2.3*).

Figure 8. Range Measurement graph showing thresholds

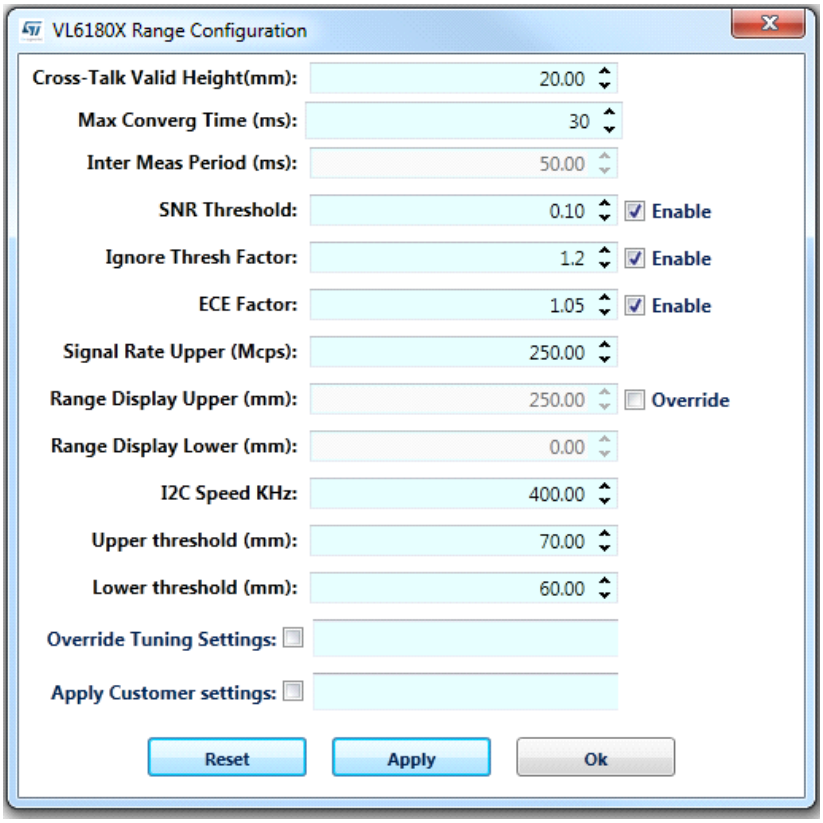


2.2.3 Configuration settings

The **Configuration** dialog allows the user to configure key parameters and initialization settings.

To access the **Configuration** dialog, click on the **Configure** button in the **Ranging** tab.

Figure 9. Configuration dialog



The parameters and settings that can be changed by the user are described in *Table 4*. The **Reset** button resets the parameters to use the default settings.

Note: When you have changed the settings (override and customer), the hardware must be reset (powered off and on) to ensure the new settings are used.

Table 4. Configuration dialog

Field	Description
Cross-Talk Valid Height (mm)	This parameter defines the minimum range measurement for which Cross-Talk compensation will be applied. If the raw range measurement is greater than this parameter, cross-talk compensation will be applied. This parameter ranges from 0..30mm, with the default being 20mm.
Max Converg Time (ms)	Maximum convergence time (50 ms max, default = 30 ms). This can be reduced but doing so will proportionally limit the minimum detectable signal rate.
Inter Meas Period (ms)	Inter measurement period - The time delay between measurements in continuous range mode. Range = 10 ms to 2.55 seconds (default = 50 ms).

Table 4. Configuration dialog (continued)

Field	Description
SNR Threshold	The minimum SNR threshold below which a range measurement is rejected. The default value is 0.06.
Ignore Thresh Factor	This is used to ensure the device is not able to range on the glass. The signal rate must be above the ignore threshold before a range measurement will be considered valid. The default value is 1.2. When adjusting the Ignore Threshold Factor, x-talk calibration must be performed to ensure that a valid cross-talk compensation factor has been determined, see *Section 2.1.2*. Ignore Threshold (MCpS) = cross-talk compensation Factor (MCpS) * Ignore Threshold Factor (MCpS
ECE Factor	The VL6180X has a built in Early Convergence Estimate feature. When enabled, the rate of convergence is automatically calculated 0.5 ms after the start of each measurement. If the return count is below the ECE threshold the measurement is aborted. This minimizes power consumption and reduces red glow when there is no target. The ECE threshold is calculated as follows: ECE threshold = convergence threshold / (max_convergence * 2 *1.2)
Signal Rate Upper (MCpS)	Graph vertical scale limit.
Range Display Upper (mm)	Graph vertical scale limit (max of 300 mm).
I2C Speed KHz	I^2C interface control speed. This cannot be changed.
Upper threshold (mm)	Upper threshold value. Default value is 70 mm. This is enabled by selecting the **Enable thresholding** box next to the **Range Management** graph, see *Section 2.2.2*
Lower threshold (mm)	Lower threshold value. Default value 60 mm. This is enabled by selecting the **Enable thresholding** box next to the **Range Management** graph, see *Section 2.2.2*
Override Tuning Settings	When selected, tuning settings defined in an external text file can be applied to override default settings applied within the software. To apply tuning settings, check the box and select the file containing the settings (see the Release Notes for filename and version information).
Apply Customer Settings(1)	When selected, customer settings defined in an external text file can be applied. The purpose of the customer settings is to apply specific settings required to meet specific customer needs. To apply external customer settings, check the box and select the file containing the settings (see the Release Notes for filename and version information).

1. Of the two settings files, customer settings get applied last.

2.3 Ambient light sensing (ALS) mode

Ambient Light Sensing mode can be activated in the **ALS** tab. This tab displays the **ALS Count** graph showing ALS Count/Lux versus Samples, as shown in *Figure 10*. *Table 5* lists the buttons available in the tab.

Figure 10. ALS tab

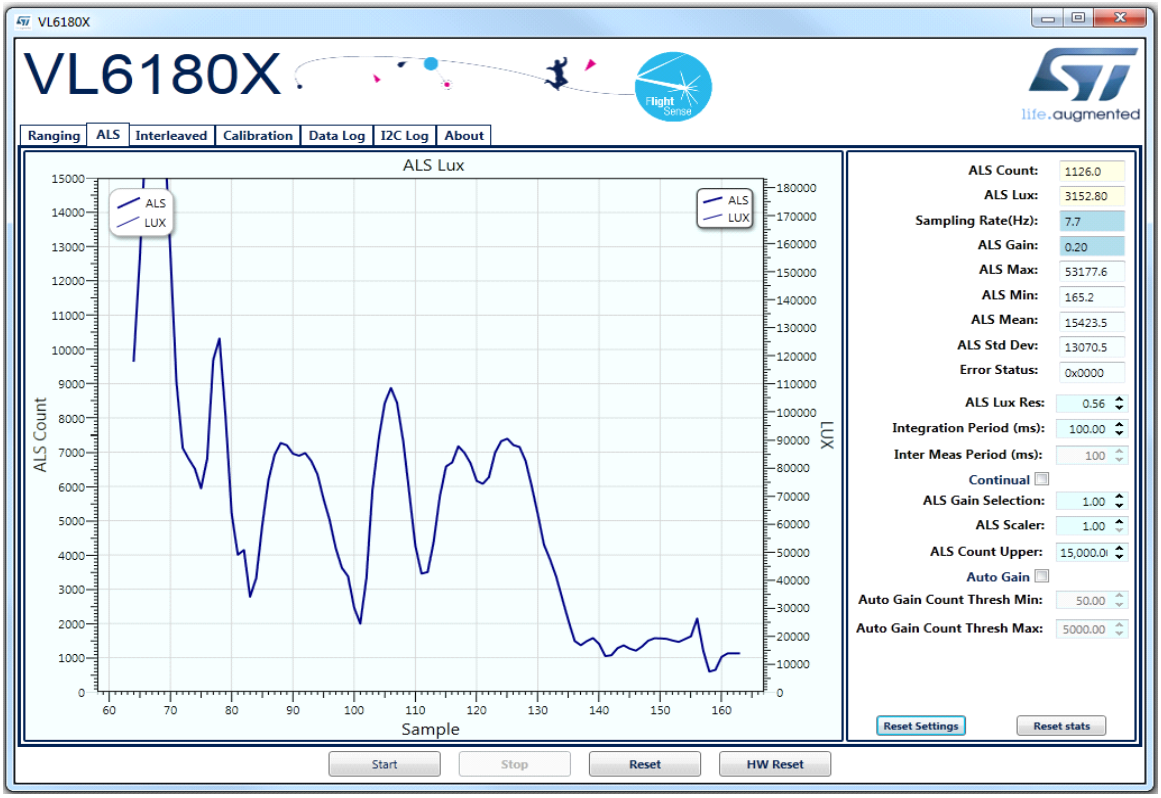


Table 5. Buttons in the ALS tab

Button	Description
Start (**Pause/Resume**)	Click on **Start** to begin measuring the ALS count. The **Start** button then changes to **Pause/Resume**.
Stop	Click on **Stop** to stop measuring the ALS count.
Reset	The **Reset** button resets the I^2C communications interface between the application and the VL6180X.
Reset Settings	The **Reset Settings** button resets the parameters to use the default settings
Reset Stats	The **Reset Stats** button clears the measurement statistics **Max**, **Min**, **Mean** and **Std Dev** values.

To the right of the **ALS** graph the information described in *Table 6* is displayed.

Table 6. ALS information

Field	Description
ALS Count	This is the raw output from the ambient light sensor. The count is proportional to the light level. The count output is a 16-bit binary value.
ALS Lux	The **ALS Count** value is converted automatically to a Lux value depending on the **ALS Lux Res**, **ALS Gain**, **Integration Period** and **ALS Scaler** settings.
Sampling Rate (Hz)	The number of ALS samples measured per second (PC dependent).
ALS Gain	Displays the actual gain value applied corresponding to the **ALS Gain Selection** setting.
ALS Max, **Min**, **Mean**, **Std Dev**	These are post-processed measurement statistics to make noise evaluation easier to characterize. The max, min and mean are the ALS data measured by the sensor over 100 sample points.
Error Status	If there is an ALS error, the ALS result error code will be displayed here, as defined in the data sheet: Address 0x04E.
ALS Lux Res	This calibrates the ALS Count-Lux conversion. The characterized **ALS Lux Res** (without glass) is 0.56 (default). This value must be re-calibrated if glass is added or the air gap is modified, see “Recalibrating ALS Lux Res for glass”.
Integration Period (ms)	The integration period (T_{int}) is the time range, during a single ALS measurement, over which Lux data is captured and averaged. The default integration period is 100 ms.
Inter Meas Period (ms)	The inter-measurement period is the time between each ALS measurement in continuous ALS mode. The default inter-measurement period is 100 ms.
Continual	Changes ALS mode from single-shot to continuous mode.
ALS Gain Selection	This is the device register setting 0 to 7. The corresponding gain value is displayed in the **ALS Gain** box. Gain settings are as follows: 0: ALS Gain = 1 1: ALS Gain = 1.25 2: ALS Gain = 1.67 3: ALS Gain = 2.5 4: ALS Gain = 5 5: ALS Gain = 10 6: ALS Gain = 20 7: ALS Gain = 40
ALS Scaler	The count output is a 16-bit value. Internally, the device uses a 20-bit counter. Gain and integration time are normally used to increase sensitivity. However, if this is not sufficient and more resolution is required in low light, the ALS scaler can be used to access the 4 LSBs of the internal counter. Apply a value in the range 2 to 15 to apply additional gain.
ALS Count Upper	This is the maximum scale value for the vertical axis. The default value is 15000. The user can input a new value to scale the **ALS Count** graph up or down as required for measurements, up to a maximum value of 65,000.

Table 6. ALS information (continued)

Field	Description
Auto Gain	Enables and disables the auto-gain feature. Auto-gain automatically adjusts the gain selection in response to the current ALS Count value in order to provide and effective dynamic range for the current lighting conditions.
Auto Gain Count Thresh Min	The manual Auto Gain ALS count threshold minimum value in Auto Gain mode.
Auto Gain Count Thresh Max	The manual Auto Gain ALS count threshold maximum value in Auto Gain mode.

Recalibrating ALS Lux Res for glass

To recalibrate the **ALS Lux Res** for glass:

1. Set **ALS Gain Selection** to **0** (ALS Gain=x1), **Integration period** to **100** ms and **ALS Scaler** to **1**.
2. Either note the **ALS Lux** value without glass while looking at a reasonably diffuse scene (for example, a ceiling) or use the transmission characteristics of the glass if known.
3. Add glass and note the new **ALS Lux** value.
4. Multiply the **ALS Lux Res** value by the ratio of new/old Lux value to compensate for the attenuation of the glass.

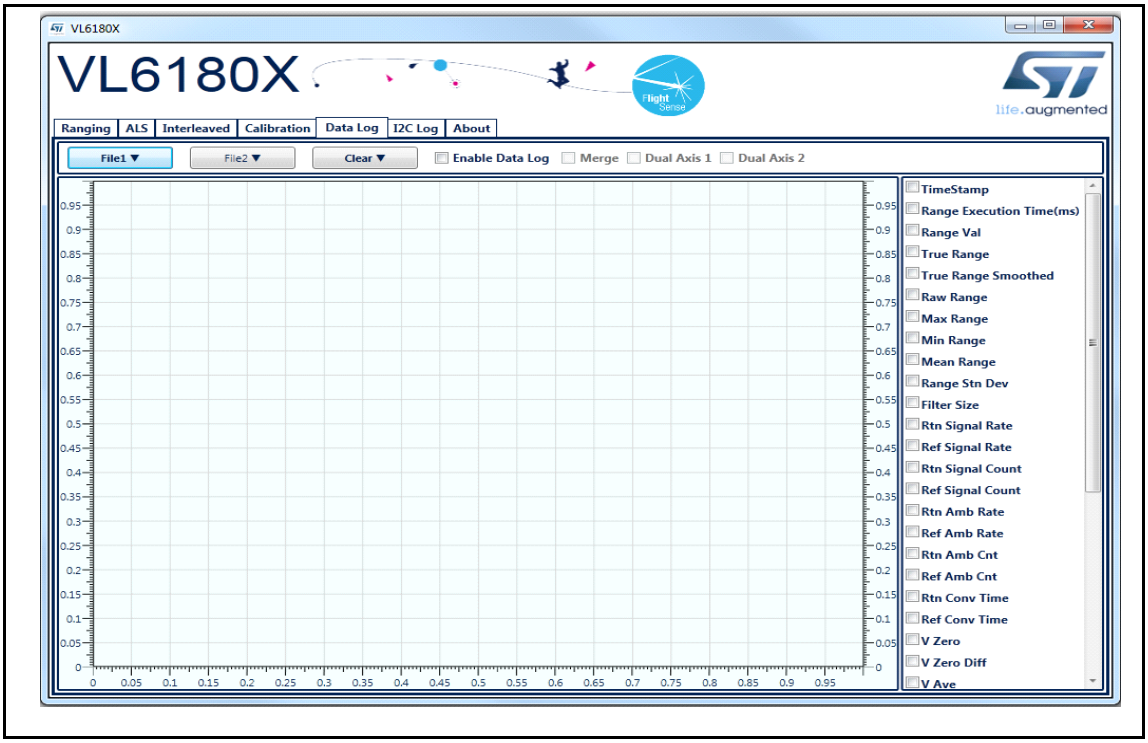
2.4 Creating a data log

The **Data Log** tab is used to record data during ranging and ALS modes. For every measurement, relevant system data is stored in a comma separated value file (.csv) identified by date and time.

To enable data logging, in the **Data Log** tab, check the **Enable Data Log** box, see *Figure 11*.

Data logging should be selected either prior to starting measurements or during the paused state.

Figure 11. Data Log tab



Data log files are created with unique filenames and stored in `C...\Users\username\AppData\Local\STMicroElectronics\VL6180XEVK\DataLog\`. See *Appendix A: Data log file* for an example.

Before you can switch off data logging, the device must first stop ranging. To do this, click on the **Stop** button in the **Ranging** tab, see *Section 2.2: Measuring the range*.

The **File1** button allows the user to open an existing data log .csv file containing a captured ranging data log.

Once the file has been opened, the menu to the right-hand side allows the user to select the data to plot. The menu displays all the data types recorded in the data log file.

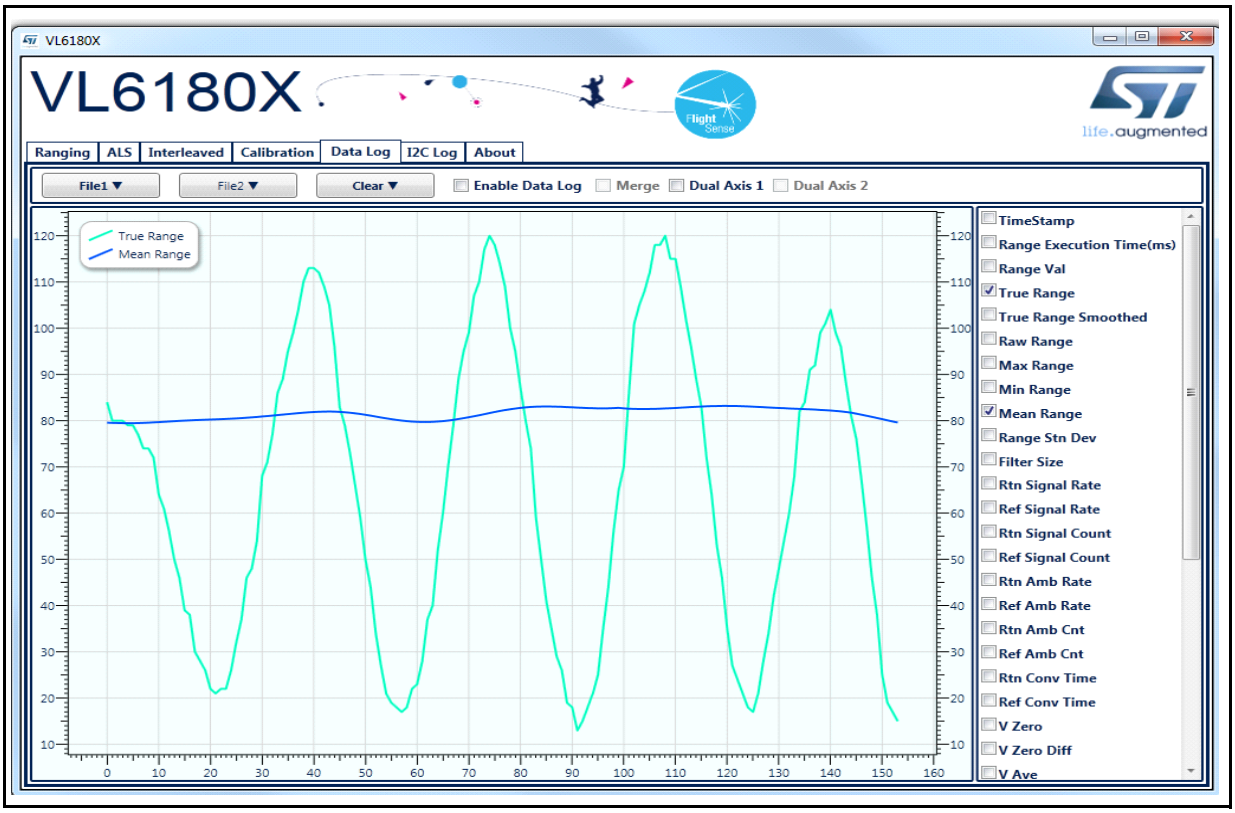
The **File2** button allows the user to open another existing data log .csv file containing the captured ranging data log. By clicking on the **File2** button, the screen is split in two and the File2 graph is displayed below the File1 graph.

The **Merge** button allows File1 and File2 to be plotted on the same graph.

When plotting data, the y-axis scale automatically adjusts to suit the selected data set. When plotting multiple data items, the graph is adjusted to accommodate all scales.

Figure 12 shows an example of how various data is selected and displayed for a ranging data log.

Figure 12. Ranging data log example



2.5 Recording I²C transactions

The **I2C Log** tab is used to record I²C transactions during ranging mode. The I²C transactions are stored in a unique file (`.txt`) identified by date and time.

To enable I²C logging check the **Enable I2C Logging** box in the **I2C Log** tab.

I²C log files are stored in `...\Users\username\AppData\Local\STMicroElectronics\VL6180XEVK\I2C\`. See *Appendix B: I2C log file* for an example.

The **Load previous** button allows the user to open an existing I²C log .txt file containing captured I²C transactions.

The Log live button displays I²C transactions in real time on the display

Before you can switch off I²C logging, the device must first stop ranging measurements. To do this, click on the **Stop** button in the **Ranging** tab, see *Section 2.2: Measuring the range*.

2.6 Interleaved mode

Interleaved mode performs range and ALS measurements together in an interleaved sequence and is performed by selecting the Interleaved Tab, as shown in *Figure 13*.

During interleaved mode ALS measurements are performed in continual mode, with a ‘Single Shot’ measurement being performed immediately after each ALS measurement. It is

therefore necessary that the inter-measurement period is large enough to perform both ALS and range measurements. Therefore the following condition must be satisfied. InterMeasPeriod >= AlsIntegrationPeriod + RangeConvergenceTime.

Figure 13. Interleaved mode tab

2.7 Persistent data

Specific data values are remembered between execution cycles of the premium EVK software application. The remembered values are:

- Range Offset
- Cross-Talk compensation factor
- Maximum Convergence Time
- Inter measurement period
- SNR Threshold
- Ignore Threshold Factor
- ECE Factor
- External NVM, Register Tuning and Patch Files
- Maximum ALS Count
- ALS Lux Resolution
- ALS Integration period
- ALS Inter-measurement period
- ALS Gain

Appendix A Data log file

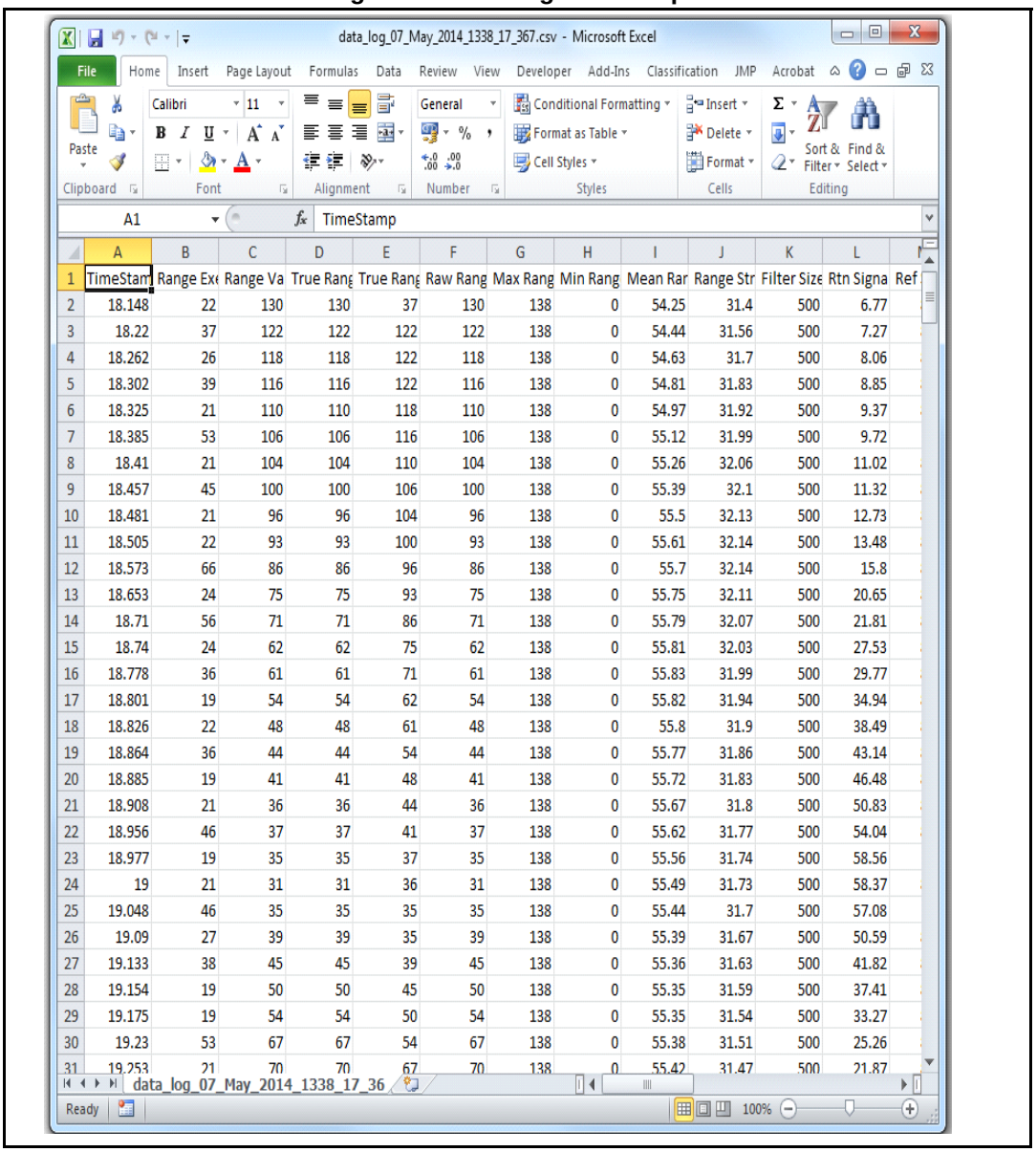
Each data log is stored in a uniquely named `.csv` file. The data log filename configuration is `data_log_DD_MMM_YYYY_hhmm_ss_SSS.csv`.

Where:

- *DD_MMM_YYYY* is the date the log file was created, for example `17_Apr_2013`
- *hhmm* is the time (hours, minutes) the log file was created, for example `1025`
- *ss_SSS* is the time (seconds, milliseconds) the log file was created, for example 15_657

An example of a ranging data log is shown in *Figure 14*

Figure 14. Data log file example



TimeStam	Range Ex	Range Va	True Rang	True Rang	Raw Rang	Max Rang	Min Rang	Mean Rar	Range Str	Filter Size	Rtn Signa	Ref
18.148	22	130	130	37	130	138	0	54.25	31.4	500	6.77	
18.22	37	122	122	122	122	138	0	54.44	31.56	500	7.27	
18.262	26	118	118	122	118	138	0	54.63	31.7	500	8.06	
18.302	39	116	116	122	116	138	0	54.81	31.83	500	8.85	
18.325	21	110	110	118	110	138	0	54.97	31.92	500	9.37	
18.385	53	106	106	116	106	138	0	55.12	31.99	500	9.72	
18.41	21	104	104	110	104	138	0	55.26	32.06	500	11.02	
18.457	45	100	100	106	100	138	0	55.39	32.1	500	11.32	
18.481	21	96	96	104	96	138	0	55.5	32.13	500	12.73	
18.505	22	93	93	100	93	138	0	55.61	32.14	500	13.48	
18.573	66	86	86	96	86	138	0	55.7	32.14	500	15.8	
18.653	24	75	75	93	75	138	0	55.75	32.11	500	20.65	
18.71	56	71	71	86	71	138	0	55.79	32.07	500	21.81	
18.74	24	62	62	75	62	138	0	55.81	32.03	500	27.53	
18.778	36	61	61	71	61	138	0	55.83	31.99	500	29.77	
18.801	19	54	54	62	54	138	0	55.82	31.94	500	34.94	
18.826	22	48	48	61	48	138	0	55.8	31.9	500	38.49	
18.864	36	44	44	54	44	138	0	55.77	31.86	500	43.14	
18.885	19	41	41	48	41	138	0	55.72	31.83	500	46.48	
18.908	21	36	36	44	36	138	0	55.67	31.8	500	50.83	
18.956	46	37	37	41	37	138	0	55.62	31.77	500	54.04	
18.977	19	35	35	37	35	138	0	55.56	31.74	500	58.56	
19	21	31	31	36	31	138	0	55.49	31.73	500	58.37	
19.048	46	35	35	35	35	138	0	55.44	31.7	500	57.08	
19.09	27	39	39	35	39	138	0	55.39	31.67	500	50.59	
19.133	38	45	45	39	45	138	0	55.36	31.63	500	41.82	
19.154	19	50	50	45	50	138	0	55.35	31.59	500	37.41	
19.175	19	54	54	50	54	138	0	55.35	31.54	500	33.27	
19.23	53	67	67	54	67	138	0	55.38	31.51	500	25.26	
19.253	21	70	70	67	70	138	0	55.42	31.47	500	21.87	

Appendix B I²C log file

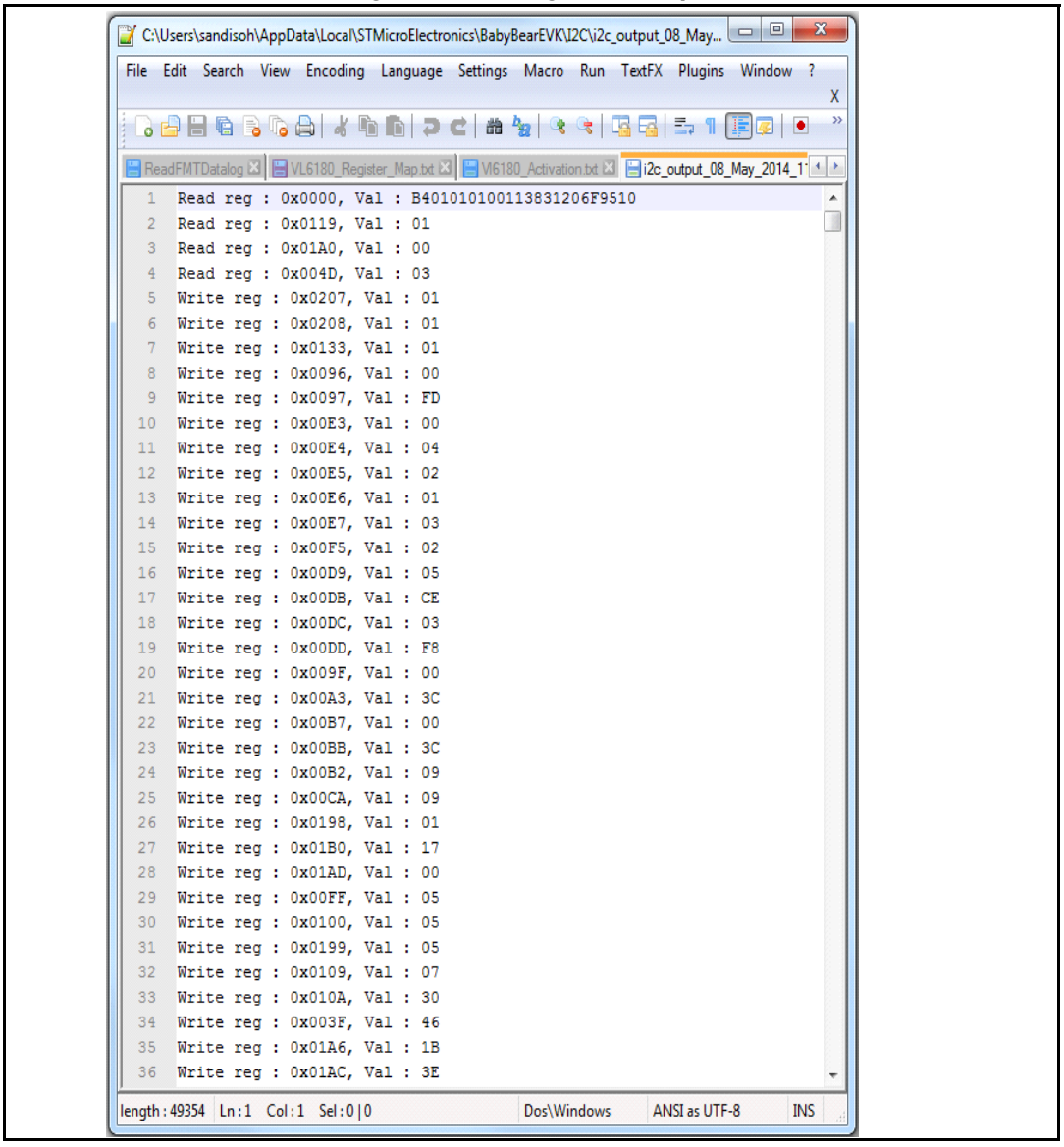
Each I²C log is stored in a uniquely named .txt file. The I²C log filename configuration is `i2c_output_DD_MMM_YYYY_hhmm_ss_SSS.txt`.

Where:

- *DD_MMM_YYYY* is the date the log file was created, for example `07_May_2013`
- *hhmm* is the time (hours, minutes) the log file was created, for example `1553`
- ss_SSS is the time (seconds, milliseconds) the log file was created, for example 15_657

An example of a I²C log is shown in *Figure 15*.

Figure 15. I²C log file example


C:\Users\sandisoh\AppData\Local\STMicroElectronics\BabyBearEVK\I2C\i2c_output_08_May...
File Edit Search View Encoding Language Settings Macro Run TextFX Plugins Window ?
ReadFMTDatalog
VL6180_Register_Map.txt
VI6180_Activation.txt
i2c_output_08_May_2014_1
1 Read reg : 0x0000, Val : B401010100113831206F9510
2 Read reg : 0x0119, Val : 01
3 Read reg : 0x01A0, Val : 00
4 Read reg : 0x004D, Val : 03
5 Write reg : 0x0207, Val : 01
6 Write reg : 0x0208, Val : 01
7 Write reg : 0x0133, Val : 01
8 Write reg : 0x0096, Val : 00
9 Write reg : 0x0097, Val : FD
10 Write reg : 0x00E3, Val : 00
11 Write reg : 0x00E4, Val : 04
12 Write reg : 0x00E5, Val : 02
13 Write reg : 0x00E6, Val : 01
14 Write reg : 0x00E7, Val : 03
15 Write reg : 0x00F5, Val : 02
16 Write reg : 0x00D9, Val : 05
17 Write reg : 0x00DB, Val : CE
18 Write reg : 0x00DC, Val : 03
19 Write reg : 0x00DD, Val : F8
20 Write reg : 0x009F, Val : 00
21 Write reg : 0x00A3, Val : 3C
22 Write reg : 0x00B7, Val : 00
23 Write reg : 0x00BB, Val : 3C
24 Write reg : 0x00B2, Val : 09
25 Write reg : 0x00CA, Val : 09
26 Write reg : 0x0198, Val : 01
27 Write reg : 0x01B0, Val : 17
28 Write reg : 0x01AD, Val : 00
29 Write reg : 0x00FF, Val : 05
30 Write reg : 0x0100, Val : 05
31 Write reg : 0x0199, Val : 05
32 Write reg : 0x0109, Val : 07
33 Write reg : 0x010A, Val : 30
34 Write reg : 0x003F, Val : 46
35 Write reg : 0x01A6, Val : 1B
36 Write reg : 0x01AC, Val : 3E
length : 49354 Ln : 1 Col : 1 Sel : 0 | 0
Dos\Windows
ANSI as UTF-8
INS

Revision history

Table 7. Document revision history

Date	Revision	Changes
14-May-2014	1	Initial release
23-May-2014	2	Correct typo error
10-Jun-2014	3	Change document properties
19-Nov-2014	4	Change disclaimer and confidentiality level

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